WHAT IS CLAIMED IS:

1. A photonic assisted emitter, comprising:

an at least partially transparent electron source layer;

a thin metal layer; and

a tunneling layer disposed between said at least partially transparent electron source layer and said thin metal layer.

2. An emitter as defined in claim 1 wherein said at least partially transparent electron source layer comprises an optically transparent metal oxide.

3. An emitter as defined in claim 2 wherein said optically transparent metal oxide comprises InSnO.

4. An emitter as defined by claim 1 wherein said tunneling layer is disposed on said at least partially transparent electron source layer.

5. An emitter as defined by claim 1 wherein said tunneling layer comprises nodular silicon.

6. An emitter as defined by claim 1 wherein said tunneling layer has a thickness of between about 200 Å and about 1,000 Å.

7. An emitter as defined by claim 1 wherein said tunneling layer has a thickness of about 1,000 Å.

8. An emitter as defined by claim 1 further comprising an

oxide layer disposed on said tunneling layer.

9. An emitter as defined by claim 8 wherein said oxide layer has a thickness of between about 50 Å and about 200 Å.

10. An emitter as defined by claim 8 wherein said oxide layer has a thickness of about 50 Å.

11. An emitter as defined by claim 1 wherein said thin metal layer comprises a porous thin metal layer having nanohole openings.

12. An emitter as defined by claim 11 wherein a diameter of said nanohole openings are between about 1 nanometer and about 100 nanometers.

13. An emitter as defined by claim 11 wherein said nanohole openings are uniformly distributed on average but randomly spread across the surface of said porous thin metal layer.

14. An emitter as defined by claim 11 wherein said porous thin metal layer has a porosity of at least 12.5%.

15. An emitter as defined by claim 1 wherein said thin metal layer comprises platinum.

16. An emitter as defined in claim 1 wherein said thin metal layer has a thickness of between about 20 Å and about 120 Å.

17. An emitter as defined in claim 1 wherein said thin metal

layer has a thickness of about 100 Å.

18. An emitter as defined in claim 1, further comprising a light emitting layer, wherein said transparent conducting layer is disposed on said light emitting layer.

19. An emitter as defined in claim 18, wherein said light emitting layer comprises Si_xN_y.

20. An emitter as defined in claim 18, wherein said light emitting layer has a thickness between about 100 microns and about 1000 microns.

21. An emitter as defined in claim 18, wherein said light emitting layer has a thickness of about 500 microns.

22. An emitter as defined in claim 18, further comprising a substrate contact layer, wherein said light emitting layer is disposed on said substrate contact layer.

23. An emitter as defined in claim 18, wherein said light emitting layer comprises an organic light emitting device.

24. An integrated circuit, comprising:
a plurality of emitters as defined by claim 1; and
control circuitry connected to said plurality of emitters.

25. A device making use of emissions, the device comprising:
an emitter as defined by claim 1; and

a target, said emitter and said target being arranged to direct said emissions from said emitter toward said target to cause an effect on said target.

26. A device as defined by claim 25 wherein said target comprises one of a memory medium or a display medium.

27. A device as defined by claim 26, further comprising focusing means positioned between said target and said thin metal layer.

28. A device as defined by claim 27 wherein said focusing means comprises an electrostatic focusing lens having an aperture in a conductor settable at a conductor voltage, said conductor voltage being adjustable to change the focusing effect of said focusing lens.

29. A device as defined by claim 25 wherein said target comprises a memory medium, and wherein said effect comprises a phase change, said phase change being detectable through measurement of electrical properties of said memory medium.

30. A device as defined by claim 29, further comprising a mover connected to one of said electron source or said memory medium.

31. A device as defined by claim 25 wherein said target comprises a display medium having a plurality of pixels, and wherein said effect comprises a visual change in one of said pixels.

32. An emitter device comprising:

a plurality of emitters as defined by claim 1 arranged in an array of emitters;

a memory medium;

a plurality of focusing lenses arranged to cooperate with said array of emitters, each of said focusing lenses being configured to focus electrons emitted from one of said plurality of emitters and direct said focused electrons towards said memory medium, said focused electrons causing a structural phase change in said memory medium upon impact; and

a reader circuit for detecting the structural phase change in said memory medium through measurement of electrical properties of said memory medium.

33. An emitter as defined by claim 1, wherein

said tunneling layer is a layer formed from a material selected from the group of materials consisting of TaO_2, SiC, Si_xN_y.

34. An emitter as defined by claim 1, wherein said tunneling comprises a material that creates photons as a by product of electron tunneling.

35. An emitter as defined by claim 34, wherein said tunneling layer is a layer formed from a material selected from the group of materials consisting of TaO_2 and Si_xN_y.

36. A method for making an emitter comprising the steps of:

forming an at least partially transparent electron source layer;

forming a tunneling layer on said at least partially transparent electron source layer; and

forming a thin metal layer on said tunneling layer.

37. A method for enhancing electron tunneling in an emitter, the method comprising the steps of:

providing an at least partially transparent electron source layer in the emitter;

providing a tunneling layer in the emitter; and

illuminating with photons a surface of said tunneling layer through said at least partially transparent electron source layer to enhance electron tunneling in the emitter.

38. An apparatus for electron emission, the apparatus comprising:

means for providing an at least partially transparent electron source layer in the emitter;

means for providing a tunneling layer in the emitter; and

means for illuminating with photons a surface of said tunneling layer through said at least partially transparent electron source layer to enhance electron tunneling in the emitter.

39. A method for enhancing electron tunneling in an emitter, the method comprising the steps of:

applying a voltage across a tunneling layer disposed between a conductive at least partially transparent electron source layer and a thin metal layer; and

illuminating a surface of said tunneling layer with photons through said conductive at least partially transparent electron source layer.

40. A photonic assisted emitter, comprising:

an at least partially transparent electron source layer;

a thin metal layer; and

a tunneling layer disposed between said at least partially transparent electron source layer and said thin metal layer, said tunneling layer including means for actively converting photons of one or more

frequencies into photons of a different band of frequencies.